

Types of Services

PUBLISHING

- Books
- Magazines
- Newspapers
- Shopping
- Trade Mags.
- Research
- ?

TV

- Subscriber
- Commercial
- Educational
- Advanced
- High Def.
- New (3D?)

COMPUTING

- New SW
- Games
- Demos
- SW Updates
- Shareware
- User Groups
- ?

EDUCATIONAL

- Class Lectures
- Reading Materials
- Course Planning
- Teacher Ed.
- Prog. Learning
- Home Study
- Movies
- Exams
- Ref. Materials
- Adult Ed.
- Supp. Aids
- ?

RADIO

- Voice
- Local Ads
- Specialized
- CD Stereo
- Record Dist.

DATA

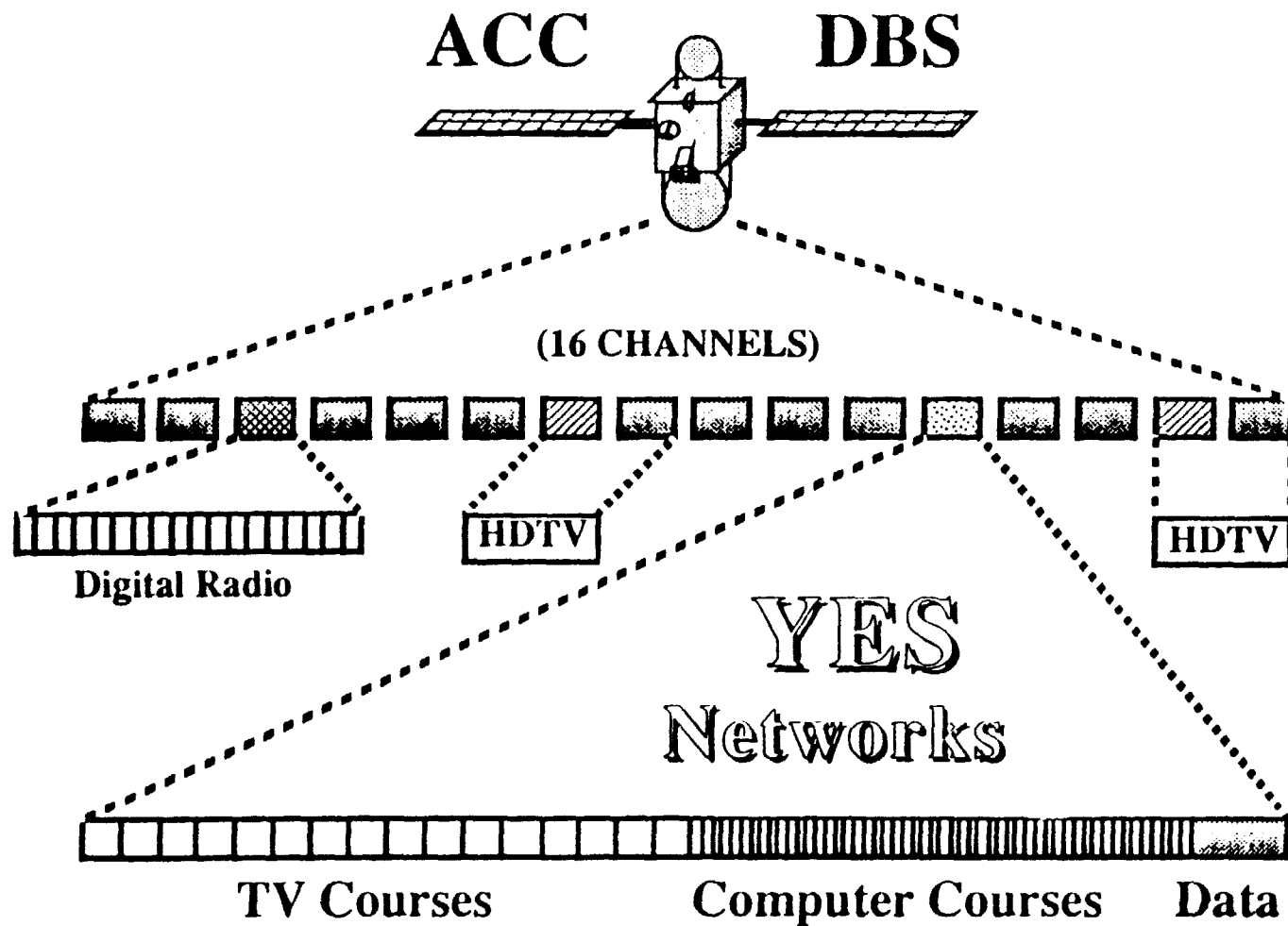
- Weather
- Markets
- Inventory
- Catalogs
- ?

NEW

?



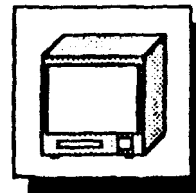
Satellite Channelization



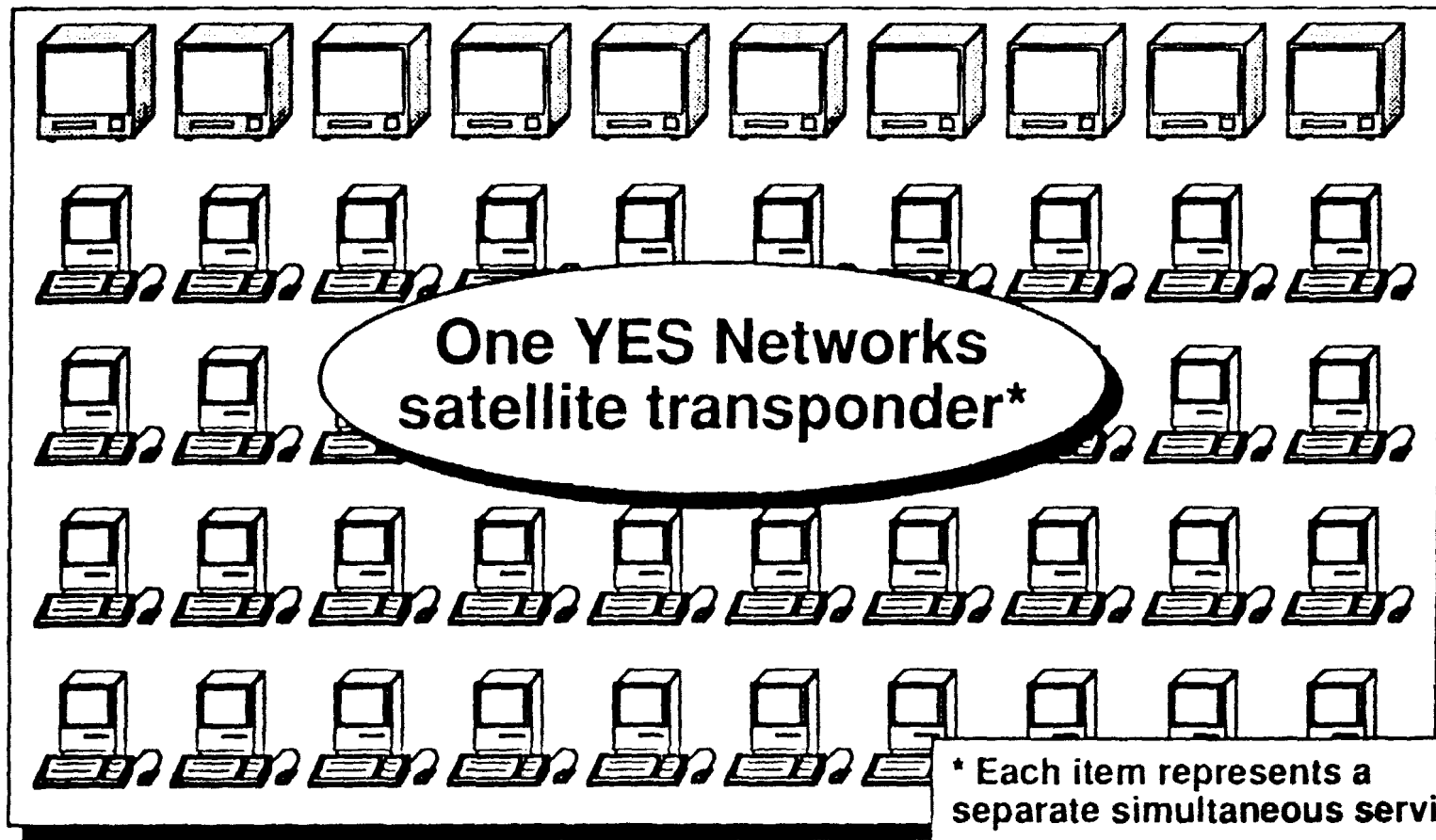


YES Networks Service Comparison

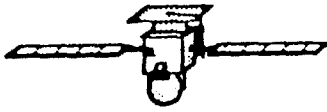
One
satellite transponder
today



VS:



Advanced Communications Engineering, Inc.



The Future is Digital

- **Advantages in noise and distortion.**
- **New media are available for digital services (light fibers, DBS, recordable Compact Disks, Digital Audio Tape).**
- **Digital demodulator chips are now economically feasible.**
- **Digital signal processing is maturing and becoming economically feasible.**
- **Digital Transmission offers a flexibility of services that is unprecedented.**



Flexibility is the Key

- **A bit is a bit-- A lot of bits is anything you want it to be.**
- **Multiple services can be multiplexed statically or dynamically.**
- **Hard encryption can provide highly effective subscriber access control.**
- **Future service enhancements can easily be added.**
- **Totally new services can easily be initiated.**

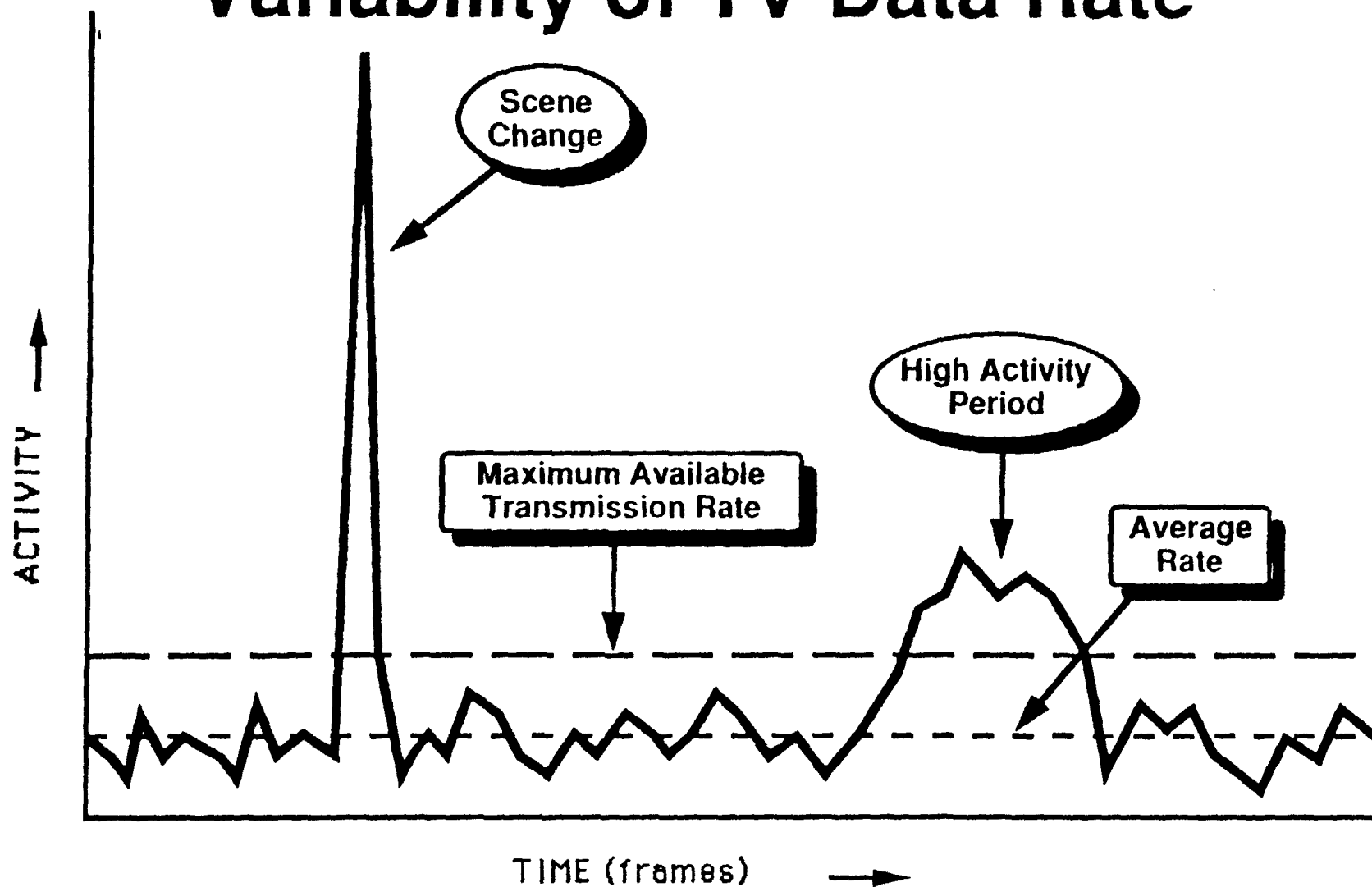


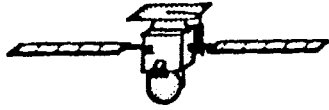
HDTV and Computers

- All proposed HDTV systems require at least partial digital transmission.
- Digital DBS can easily be made compatible with any proposed HDTV system.
- All proposed HDTV systems require large amounts of digital memory, a substantial amount of digital signal processing, and sophisticated programmable control.
- Personal computers are rapidly moving into desk-top video, have high-resolution displays, are using signal processors, and have television interfaces.
- The technology is the same.



Variability of TV Data Rate



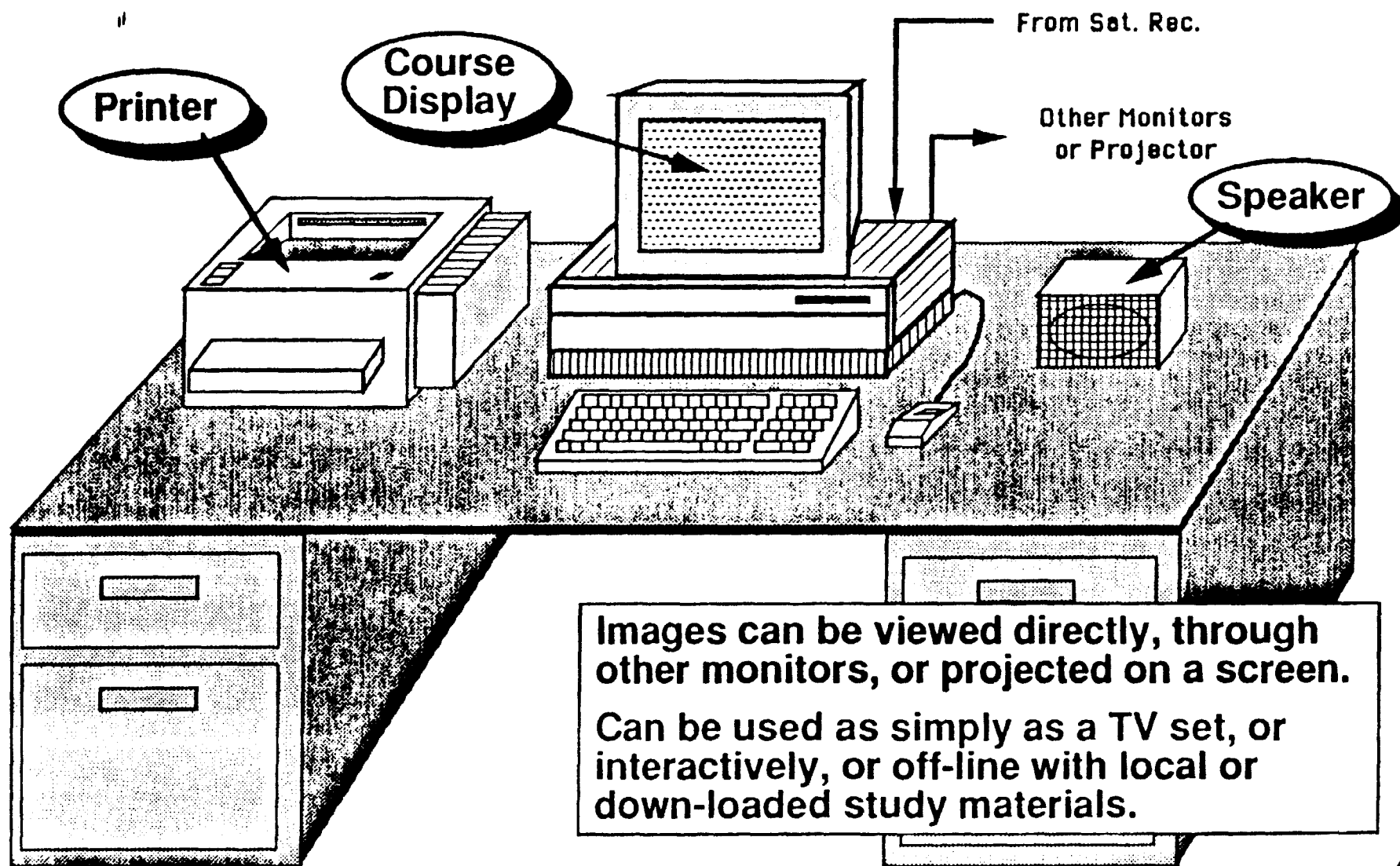


Conclusion

- **Digital DBS is the solution.**
 - **Compatible HDTV.**
 - **Educational broadcasting services.**
 - **Other new broadcasting services.**
- **This is potentially a \$100 B / year industry.**
- **Digital DBS offers a unique opportunity for the United States to reestablish its leadership in commercial electronic technologies.**



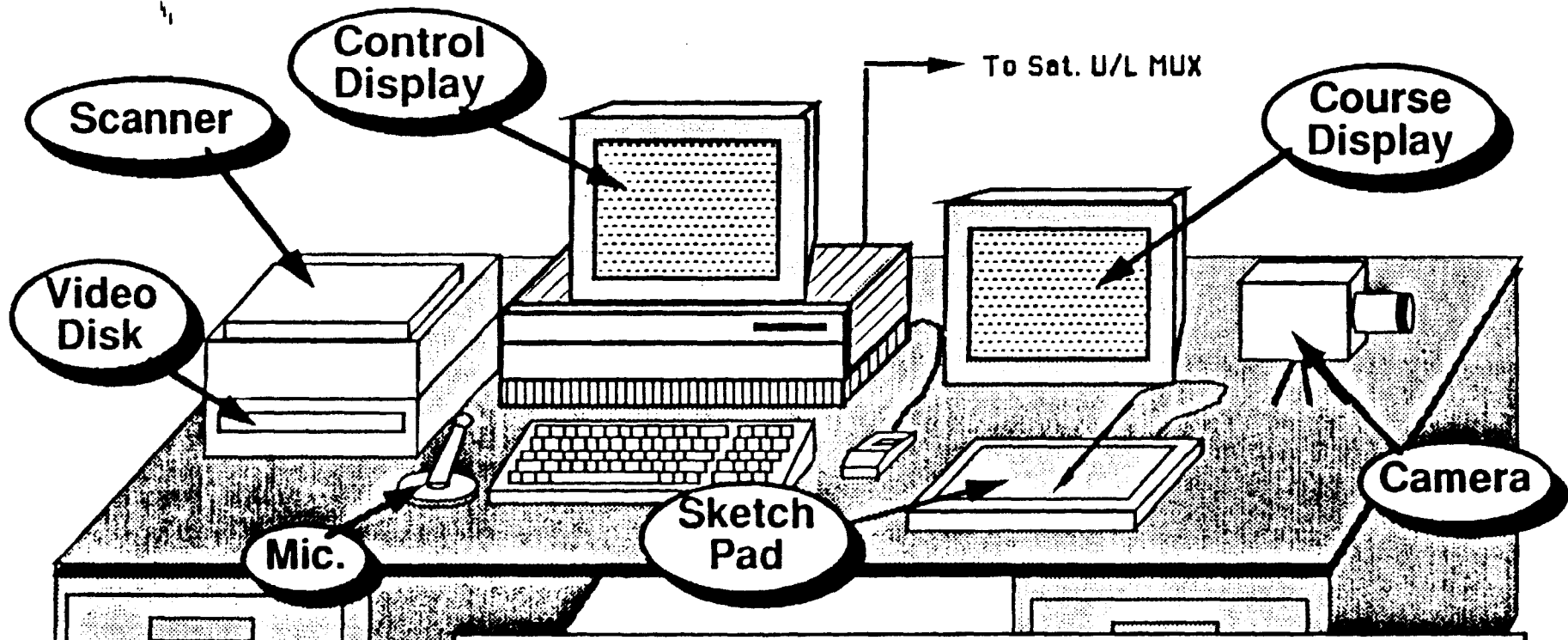
School Station



Advanced Communications Engineering, Inc.



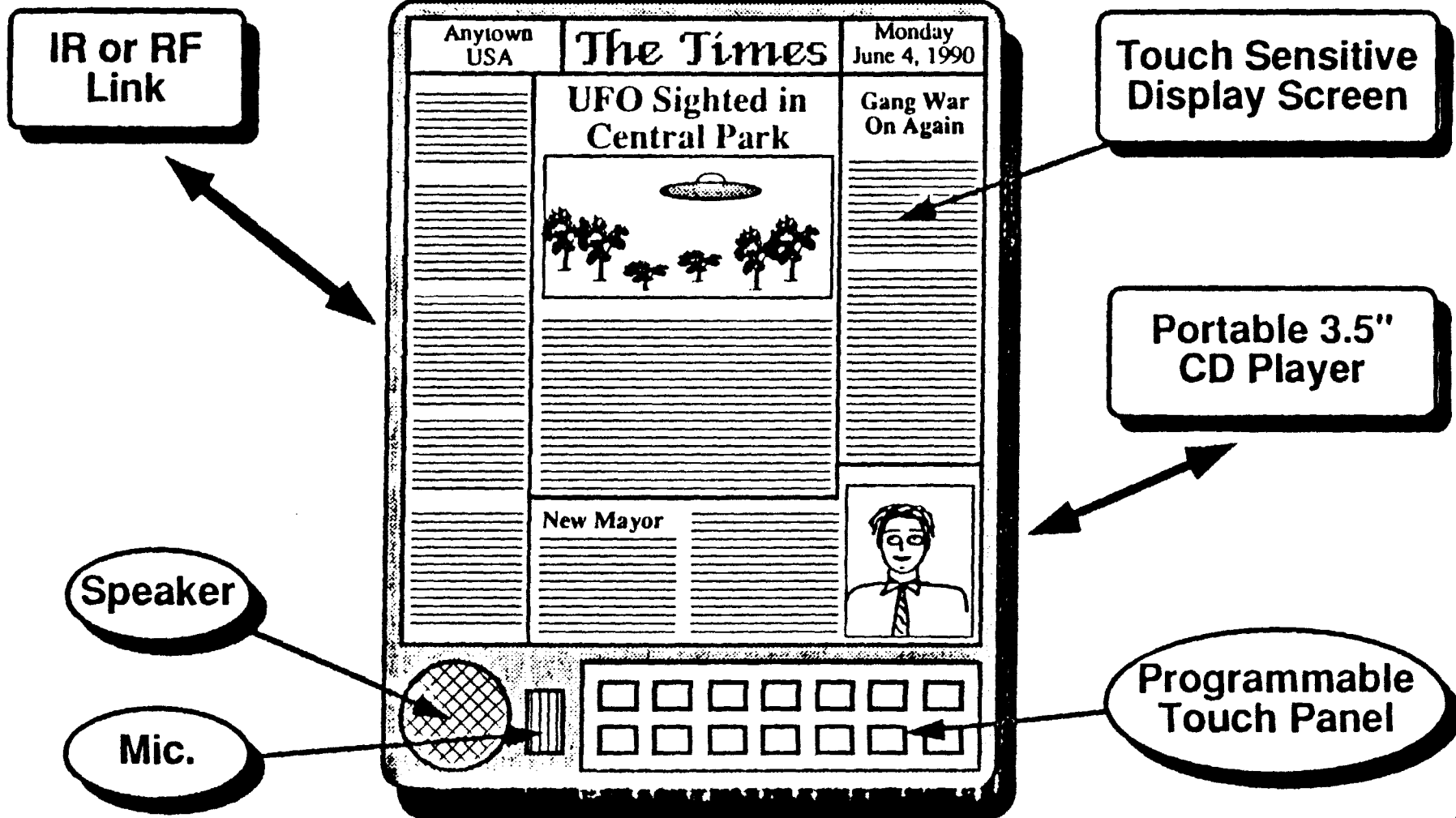
Teacher Station




Transmitted images can be as simple as vu-graphs (scanned or generated on a computer), blackboard (sketch pad), or captured TV images.

Computer animation, commercially available courseware, laser-disk images and CD images can be included if desired. Other study materials can be down-loaded to the classes.

The "ELTRON"



Advanced Communications Engineering, Inc.



Advanced Communications Corporation (ACC) is a direct broadcast satellite permittee primarily engaged in commercial communications activities including public-interest initiatives. We desire to cooperate with the U.S. Government in the following ways to satisfy three needs.

Contains
letter
M. J. G. G. G.

Education: The Need

A national program to enhance all learning opportunities

- from pre-school through college, including adult education;
- to deliver the finest teaching and information available to augment the teaching profession;
- and focusing on science, mathematics and adult literacy, among many other subjects.

Education: The Plan

- ACC will provide to the Foundation two nationwide satellite transponders to operate with two-foot diameter user antennas starting in 1992;
- The Foundation will provide free digital receivers to every U.S. school and library -- a combined value of over \$400 million;
- The YES Networks, using digital delivery, will provide well over 100 simultaneous "master teacher" video instruction courses, including:
 - Animation, computer courses, and multiple data and information channels;
 - Incentive homework programs after school and at night, that will accelerate and promote learning.
- This concept is endorsed by NSBA, AASA, NEA, and AFT.

Pilot Project for Satellite Education

- Develop integrated satellite receiver/computer terminals:
Arrange with NASA Communications and Information Programs
- Lease existing commercial satellite channel
Use larger ground antennas, begin demos/tests in 1991-2
- Educators and YES Networks develop course software
- Manufacture and distribute small terminals through FEAT
beginning in 1992
- Transition to long-term DBS education starting in 1992

HDTV and Digital DBS

NEED:

- U.S. development of High-Definition Television (HDTV); and program delivery simultaneously to rural and urban areas.

PLAN:

- Set higher goals to achieve much higher results by developing digital transmission/reception, rather than current hybrid analog proposals;
- Use digital direct broadcast satellite (DBS) delivery nationwide within already-allocated frequencies, avoiding difficult spectrum reorganization;
- Create substantial market via DBS for HDTV delivery, fostering U.S. pre-eminence in manufacturing;

This concept should cost significantly less than current proposals.

DBS as an Emergency Broadcast System

- NEED:

A viable emergency broadcast system (EBS) in event of an electromagnetic pulse (EMP) due to a nuclear burst over the U.S. that would disable terrestrial radio and TV transmitters, and conventional satellites.

- PLAN:

Harden ACC's satellites against EMP, and employ command protection to assure Executive Branch use in time of crisis; if requested.

What Is Needed?

- NASA Space Systems Development Agreement (SSDA) to launch both DBS satellites;
- NASA (or other) financial assistance to complete development of integrated digital satellite receivers (\$15-25 million);
- FCC approval of ACC's minor modification request to collocate both satellites for full-CONUS coverage;
- White House liaison assigned to coordinate activities with relevant Departments and Agencies.

Appendix A

Opportunities in Digital DBS and HDTV Systems

(YES Networks examples.)

- Satellite educational programming to all public and private elementary and secondary schools and Universities in America;
- Undergraduate and Graduate education in businesses and homes;
- Inservice teacher training;
- Information data streams to all libraries in America;
- Educational programming to all child-care centers in America;
- Parent education in home or school;
- Specialized programs for disadvantaged, gifted, talented youth;
- Adult literacy;
- Student remedial programs;
- Senior citizen learning opportunities;
- Transmission of informational and innovative materials to schools, PTAs, school boards, administrators, teachers;
- Specialized programs for vocational-technical schools;
- Lifelong education, including graduate studies through the University of America;
- Education and data transmission to support migrant students;
- Improved, widely-accessible USDA market data information exchange;
- Medical training programs to hospitals and clinics;
- Medical information interchange among medical facilities;
- Assist prison inmates rehabilitation programs;
- Emergency Broadcast System;
- Professional requalification as required by state laws.
- Professional training and informational services (legal, accounting, financial, medical, engineering, etc.).

Wilbur D Mills

CHAIRMAN

FOUNDATION FOR EDUCATIONAL ADVANCEMENT TODAY

March 20, 1989

Federal Express

The Honorable George Bush
The President
The White House
Washington, D.C. 20500

Dear Mr. President

A member of my staff contacted your scheduling office this morning to arrange an appointment with you for me.

This letter is to confirm that I am looking forward to seeing you again soon regarding several compelling areas of mutual interest which are covered in the attached overviews.

These proposed advanced educational initiatives offer a profound mechanism to implement your goal of becoming our "Education President" rather quickly. I believe it can be accomplished during your first term. Secondly, another major goal of your administration, HDTV, should be approached through digital DBS as a means to efficiently achieve a wide range of important ends. Additionally, the Emergency Broadcast System paper may be of considerable interest in connection with PD-50.

I will be accompanied by James M. Beggs, former NASA Administrator and active participant in our plans, as well as Daniel H. Garner, President of Advanced Communications Corporation, with whom I have been closely associated for over six years implementing this comprehensive project.

I commend your appointment of Governor Sununu who we understand is quite knowledgeable in emerging technologies, and I would appreciate his review as well.

The Honorable George Bush
March 20, 1989
Page Two

Please contact me at 920-1007 or 920-8669 or Ms. Kay Goss at (501) 377-1493 once you have determined an appropriate time.

With best wishes and kindest personal regards, I am

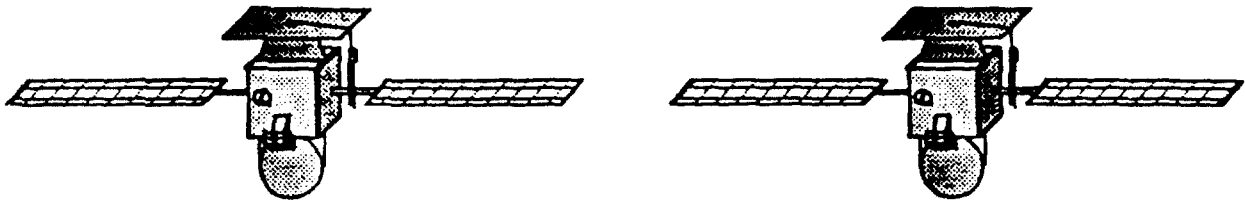
Sincerely yours,



Wilbur D. Mills

WDM/dr

cc: The Honorable John Sununu
Joseph Hagin, II
The Honorable John Paul Hammerschmidt
James M. Beggs
Daniel H. Garner



A MEANS TO RE-ESTABLISH AMERICA'S LEADERSHIP IN TECHNOLOGY AND EDUCATION

Prepared by the Foundation for Educational Advancement Today

for President George Bush

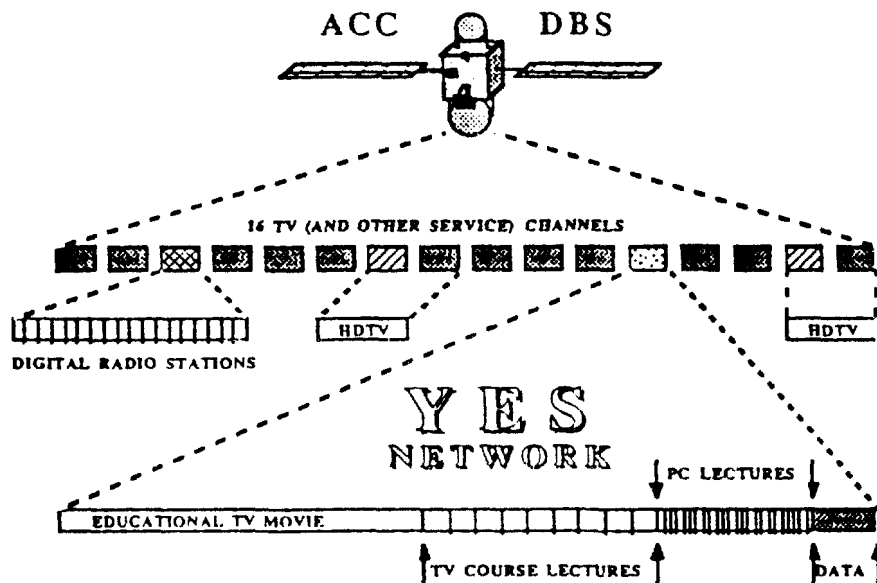
March 1989

Partners:

The Foundation for Educational Advancement Today
Advanced Communications Engineering, Inc.
YES Networks, Inc.

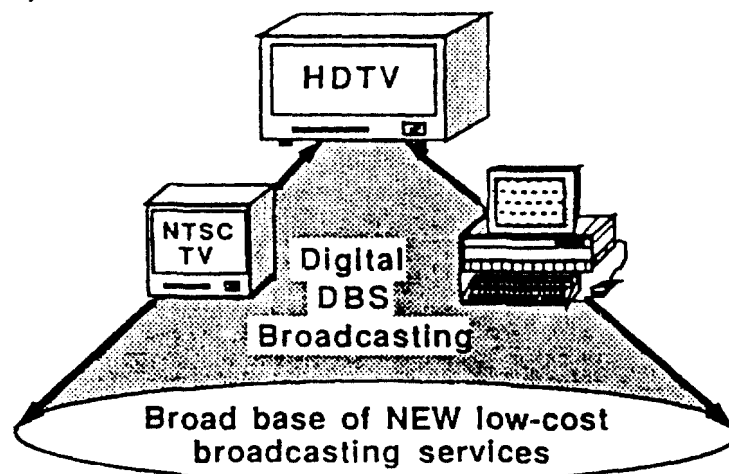
Advisors:

The National Aeronautics and Space Administration
National School Board Association's Institute for the Transfer of Technology to Education
The National Education Association
The American Association of School Administrators
The American Federation of Teachers
Advanced Communications Corporation



Summary

It is the purpose of this paper to address recent national policy issues, including America's educational shortcomings, U.S. technological leadership slippage, the industry's ability to participate in the upcoming High Definition Television (HDTV) market, and increasing reliance on foreign electronic components for defense systems. A national program is proposed that is based on recent advances in economical digital Direct Broadcast Satellite (DBS) transmission, personal computers, and HDTV to better assure America's return to world leadership and national independence in each of these areas.¹



¹For further information contact ACC, c/o 6803 Cantrell, Suite 200, Little Rock, AR 72207 (501-377-1493), or ACE c/o 722 S. Broadway #30, Redondo Beach, CA 90277 (213-540-6532).

Critical Needs in Technology and Education for the United States:

First, the United States of America is rapidly losing its leadership in the areas of science and technology, in which it was once the undisputed leader and envy of the entire world. As noted in many recent studies, science and technology provide the basis of our economy and well being, the strength of our defense, and even the hope of the planet. Superior education, especially in math and science, is absolutely essential to the nation's future vitality and defense. However, the nation's schools have declined to a point where former Secretary William Bennett described some as reaching "total melt-down."

The critical need to reverse this decline and offer quality education to everyone (children and adults), regardless of their present status or living area, is the basis of this paper. While we must teach the students, where will we find the teachers? Qualified science teachers are rare -- qualified mathematics teachers are virtually non-existent in many school systems. The solution lies in the judicious use of our available electronics technology to increase the availability of high-quality instruction (Master Teachers) and innovative learning techniques.

Secondly, commercial electronics technology is rapidly advancing and is having a substantial impact on the economies of nations and their defense capabilities. A concern recently receiving much attention is that the next generation of television systems (High Definition Television, or "HDTV") will be dominated by the Japanese and others. The realization that these new televisions are packed with digital computer-type electronics has even prompted the U.S. Dept. of Defense (i.e., DARPA) to become significantly involved in this technology in the hope of salvaging the remaining U.S. integrated circuit industry and preventing foreign domination and U.S. dependence on related computer technologies.

To insure orderly transition to HDTV, the FCC decreed that terrestrial broadcasts in the U.S. be "compatible" with existing TV broadcasts. HDTV inherently is a huge user of valuable and limited radio spectrum, requiring about five normal TV channels of standard-type transmission. A multitude of new transmission standards have been proposed for "compressed" HDTV that instead would only occupy one or two channels.

Any new TV standard will require new TV stations, transmitters and other major investments in all the major metropolitan areas. Service area "critical market mass" must be derived from individual local broadcast areas. Even so, HDTV via terrestrial broadcasting will not be available for a long time, if ever, in most remote areas. The inevitable transition to HDTV would be much smoother and more

rapid if a means were available to initially reach all areas (urban and rural) of the country simultaneously. This also would guarantee a uniquely American system that would place U.S. industry on at least an equal, if not advantageous, footing with foreign competition.

Ways and Means to Solve Both Problems (and a multitude of others):

DBS/HDTV: A few years ago, the ITU (International Telecommunications Union), through its mechanisms of conferences (1977 World Administrative Radio Conference, and 1983 Region 2 Administrative Radio Conference) established international agreements for satellite orbital locations, radio frequencies, and ground coverage areas for a new type of satellite television service called "Direct Broadcast Satellites" (DBS). These are high-power satellites which provide a signal strong enough to be received with a user antenna less than two feet in diameter in a system costing only a few hundred dollars. The FCC has been active in support of this new public benefit, assisting in clearing frequencies, setting standards, and granting several DBS satellite construction permits.

When these permits were issued several years ago, it was assumed that the service would use analog transmission. However, as the advantages of digital transmission and signal processing became more pronounced and apparent, one DBS permittee, Advanced Communications Corporation (ACC), proposed to use totally digital transmission to bring these efficient, modern capabilities into many needed applications.

Although DBS originally was envisaged as a medium for standard television (analog) transmission, digital DBS is an ideal medium for making HDTV instantly available throughout the entire nation. Any satellite receiver requires some type of convertor equipment to mate with a standard TV receiver. The flexibility of digital transmission and processing will allow DBS HDTV to be more easily and totally compatible with today's standard TV, while also being compatible with any terrestrial broadcast standard for HDTV that may be issued.

Because DBS service will draw its market from the entire nation, it will be much easier to get an early "critical market mass" than would terrestrial broadcast in establishing the U.S. HDTV market.

HDTV sets are internally much like computers or workstations containing digital processors and computer memories. On the other side of the coin, today's personal computers are becoming more like advanced TV sets or even HDTV sets. There is a rapidly growing use of personal computers to create, output, control, and modify TV images. Seminar and classroom presentations are being created on computers and then presented directly by projection or on TV screens, often with animated graphics.